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NOTES ON THE GENUS *ACINACISTYLA* FEDOTOVA & SIDORENKO (DIPTERA, CECIDOMYIIDAE) WITH DESCRIPTION OF A NEW SPECIES

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Abstract In this present paper, the genus *Acinacistyla* is transferred from the supertribe Brachineuridi to the tribe Ledomyiini of the supertribe Lasiopteridi. The generic diagnosis is revised and broadened and a key to males of the genus is given. One new species, *A. brevilobata* Jiao *et* Bu, sp. nov. from China is described and illustrated. The type specimens are deposited in the Institute of Entomology, College of Life Sciences, Nankai University, Tianjin, China.
Key words Diptera, Cecidomyiidae, *Acinacistyla*, new species.

1 Introduction

Fedotova & Sidorenko (2006) erected the genus *Acinacistyla* including *A. papposa* Fedotova & Sidorenko, 2006 and *A. applanata* (Fedotova & Sidorenko, 2005) both from Primorskiĭ Territory, Russia and placed it in the tribe Brachineurini. Gagné (2010) placed *Acinacistyla* in the supertribe Brachineuridi only including *A. papposa* in his catalogue. There has been no more species record of this genus since Fedotova & Sidorenko (2006). During the course of the research on gall midges of Brachineuridi from China, *Acinacistyla* was found that the gonocoxite having mediobasal lobe divided into two sublobes with only one sublobe clasping aedeagus, which was the synapormorphy of the tribe Ledomyiini in the supertribe Lasiopteridi, on the other hand, all of the four synapomorphies of Brachineuridi proposed by Gagné (2010) have not been presented in *Acinacistyla*, so we proposed to transfer *Acinacistyla* from the supertribe Brachineuridi to the tribe Ledomyiini of the supertribe Lasiopteridi.

Based on the material from China, a new species, *Acinacistyla brevilobata* sp. nov. is discovered and described. The genus *Acinacistyla* and the tribe Ledomyiini is recorded in China for the first time. The new species is described with the photos and the illustrations of diagnostic characters provided. A key to males of Acinacistyla species is given.

Fedotova & Sidorenko (2006) proposed the combination of *Acinacistyla applanata* (Fedotova & Sidorenko, 2005) which was transferred from the genus *Rhizomyia* Kieffer, but Gagné (2010) did not sustain this combination for lacking of detailed explanations. Because this species mentioned above is different from *Acinacistyla* including the type species and the new species from China by hypoproct emarginated deeply forming two distinct lobes without chrysanthemum-shaped sclerotized structure and palpus 3-segmented in spite of having the semblable wing vein and mediobasal lobe of gonocoxite to *Acinacistyla*, we think *applanata* Fedotova & Sidorenko is doubtful and shelve it in the genus *Rhizomyia* at present, and do not consider this species among the genus *Acinacistyla* for the diagnosis and key including comparing with the other congeners.

2 Materials and Methods

Specimens of the new species were collected by Malaise traps. Adult specimens were preserved in 70 % ethanol in the field as soon as collected. For morphological observation, some of the ethanol preserved specimens were mounted on slides in Canada balsam. The morphological terminology follows Gagné (1981). The holotype and paratypes were deposited in the Institute of Entomology, College of Life Sciences, Nankai University (abbreviated as NKUM), Tianjin, China.

Figs 1 - 5 are line drawings, Figs 6 - 10 are photographed by microscope and photomontaged by Auto-montage Software (Helicon Focus 5.3 Pro); all the figures are based on holotype (slide number: NKUCecid. No. BBH001) except Figs 6 - 7 based on paratype (slide number: NKUCecid. No. BBH003).

3 Genus *Acinacistyla* Fedotova & Sidorenko, 2006

Acinacistyla Fedotova & Sidorenko, 2006: 11.

Type species: *Acinacistyla papposa* Fedotova & Sidorenko (original designation).

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3.1 Generic Diagnosis

Male. Palpus (Fig. 6) 4 + 1-segmented (including palpiger), each of last three segments longer than first one. Antenna usually with 12 flagellomeres (Fig. 6), each with prolonged neck and one basal node except for the distal one. Wing (Fig. 8) hyaline, sparsely covered with narrow scales and setose; vein R_1 joining vein C before the half wing; vein R_5 bent a little forward, joining vein C distinctly anterior to wing apex, usually with two pores respectively at basal 1/3 and distal 1/4; vein Cu forked. Tarsal claw (Figs 1 – 2) toothed at least on forelegs; empodium a little shorter than tarsal claw. Seventh tergite (Fig. 9) reduced to one strongly sclerotized and linear band; eighth tergite reduced to unsclerotized membrane. Gonocoxite (Figs 3 – 5, 9) having mediobasal lobe with one shorter, stouter sublobe away from aedeagus and the other longer, slender sublobe clasping aedeagus; gonostylus slender and slightly arched, toothed apically; cerci with a deep depression forming two lobes; hypoproct apically with chrysanthemum-shaped sclerotized structure and subapically with a pair of longer or prolonged lobes on both sides; aedeagus gradually tapered to apex except for constriction at middle.

Female and immatures. Unknown.

3.2 Discussion

The genus *Acinacistyla* is similar to *Plesiolauthia* Mamaev in Ledomyiini by male hypoproct with two lobes, while other genera of Ledomyiini, *Isogynandromyia* Spungis, *Lauthia* Kieffer, *Ledomyia* Kieffer and *Prolauthia* Rübsaamen, have male hypoproct just simple or slightly emarginated without forming two distinct lobes. However, *Acinacistyla* is characterized by the uniqueness of hypoproct apically with chrysanthemum-shaped sclerotized structure in males among Ledomyiini (Lasiopteridi).

Fedotova & Sidorenko (2006) described *Acinacistyla* and gave detailed generic diagnosis. Based on the new species, the diagnosis is revised to give an adequate description and broadened as follows to contain all known *Acinacistyla* species: tarsal claw toothed at least on forelegs; hypoproct apically with chrysanthemum-shaped sclerotized structure and subapically with a pair of lobes on both sides.

Key to males of *Acinacistyla* species.

1. Hypoproct subapically with a pair of prolonged, geniculate lobes on both sides approximately as long as hypoproct, with a joint-shaped structure at basal 1/3; gonocoxite having mediobasal lobe with one longer, right cylindrical sublobe without prominences ····· ····· ***A. papposa* Fedotova & Sidorenko, 2006**

   Hypoproct subapically with a pair of conical lobes on both sides approximately 1/3 as long as hypoproct; gonocoxite having mediobasal lobe with one longer, winding sublobe ventrally with two prominences at middle ····· ····· ***A. brevilobata* Jiao *et* Bu, sp. nov.**

4 Species of *Acinacistyla* in China

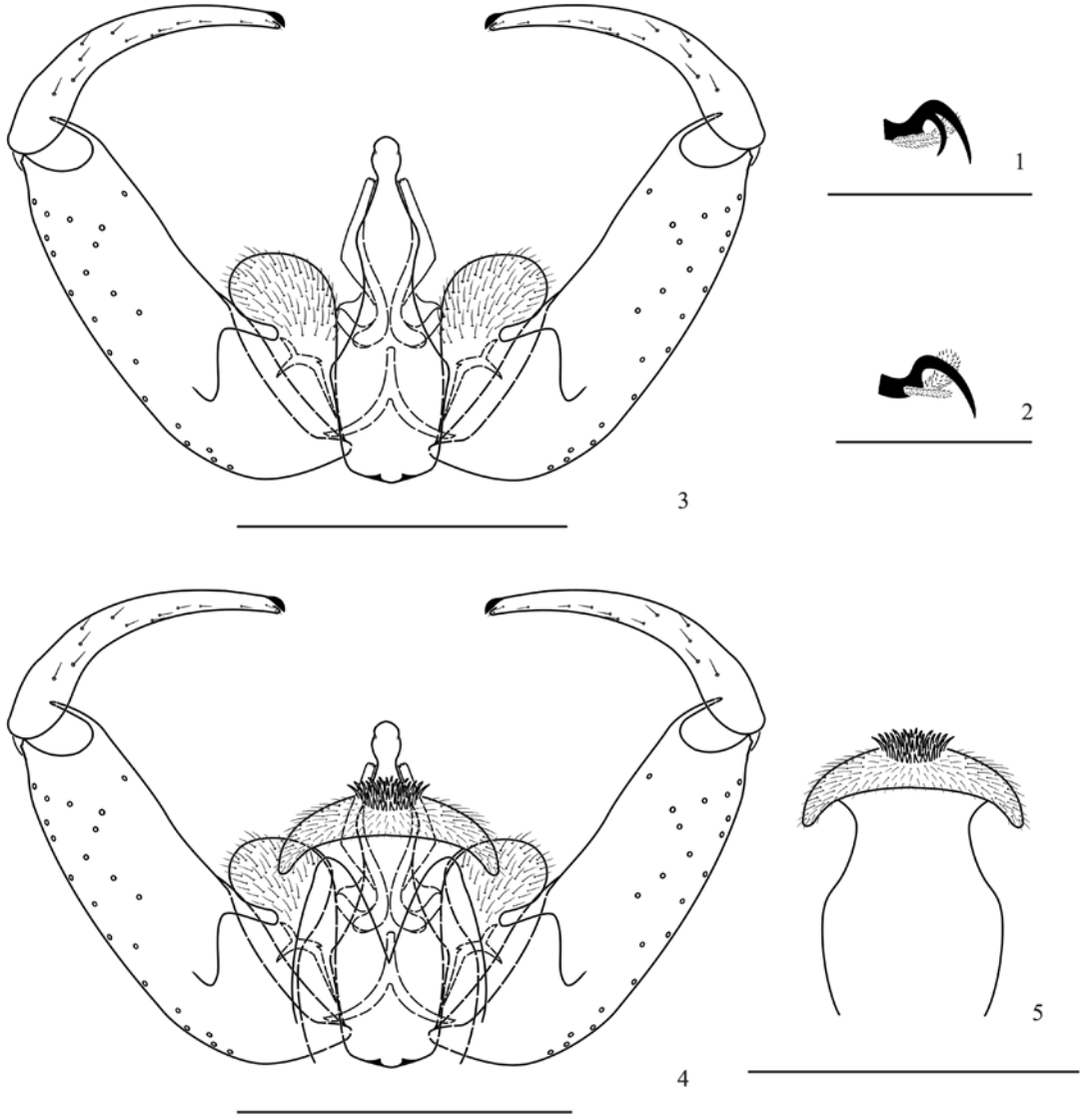
4.1 *Acinacistyla brevilobata* Jiao *et* Bu, sp. nov. (Figs 1 – 10)

Male. Body colour yellow. Body length 1.50 – 1.75 mm (n = 12). Wing length (measured from base) 1.30 – 1.75 mm (n = 12). Wing width 0.50 – 0.70 mm (n = 12).

Head (Fig. 6). Eye bridge 5 – 7 facets long in the middle of vertex as in Fig. 6. Palpus sparsely setose, 4 + 1-segmented (including palpiger), last three segments longer than first segment, palpiger small as in Fig 6. Antenna with 12 flagellomeres; pedicel subglobular, smaller than scape, both densely covered with setae ventrally; node of all flagellomeres subcylindrical, a little broadened subbasally, neck of 1st through penultimate flagellomeres prolonged, much longer than half of basal node; each node with 2 horizontal, appressed, band-shaped circumfila, subapically and subbasally respectively linked by two similar longitudinal circumfila, and 2 whorls of long, strong and irregular setae, one subbasal and one subapical; first and second flagellomeres fused; 3rd flagellomere as in Fig. 6, with node 1.6 – 2.0 (n = 12) times as long as wide and neck 4.5 – 7.0 (n = 12) times as long as wide, 1.0 – 1.5 (n = 12) times length of node.

Thorax (Fig. 7). Wing (Fig. 8) hyaline, 2.35 – 2.65 (n = 12) times as long as wide. Vein Sc weak, C, R_1 and R_5 strong; R_1 joining C just before the half wing, subapically with two smaller and closely set pores; R_5 bent a little forward, joining C distinctly anterior to wing apex, with two pores respectively at basal 1/3 and distal 1/4; vein M_3 much weaker, almost invisible; vein Cu forked and bent backward, vein PCu parallel with Cu. Legs densely covered with narrow scales and sparse setae; femur of fore-, mid- and hind-legs shorter than tibia, all with the same proportion 0.75 – 0.85 (n = 12) times; the second tarsus of fore-, mid- and hind-legs longer than tibia, with proportions respectively 1.05 – 1.20, 1.05 – 1.25 and 1.15 – 1.25 (n = 12) times. Tarsal claw (Figs 1 – 2) toothed on forelegs, and untoothed on mid- and hind-legs; empodium a little shorter than tarsal claw; pulvillus cylindrical, approximately 1/2 length of claw.

Abdomen (Fig. 10). Each tergite and sternite densely covered with scales uniformly. First through sixth tergites developed and strip-shaped with an irregular but mostly single, posterior row of setae, without lateral setae, and with one anterior pair of trichoid sensilla; first tergite concave at anterior margin and much shorter than second tergite; seventh tergite

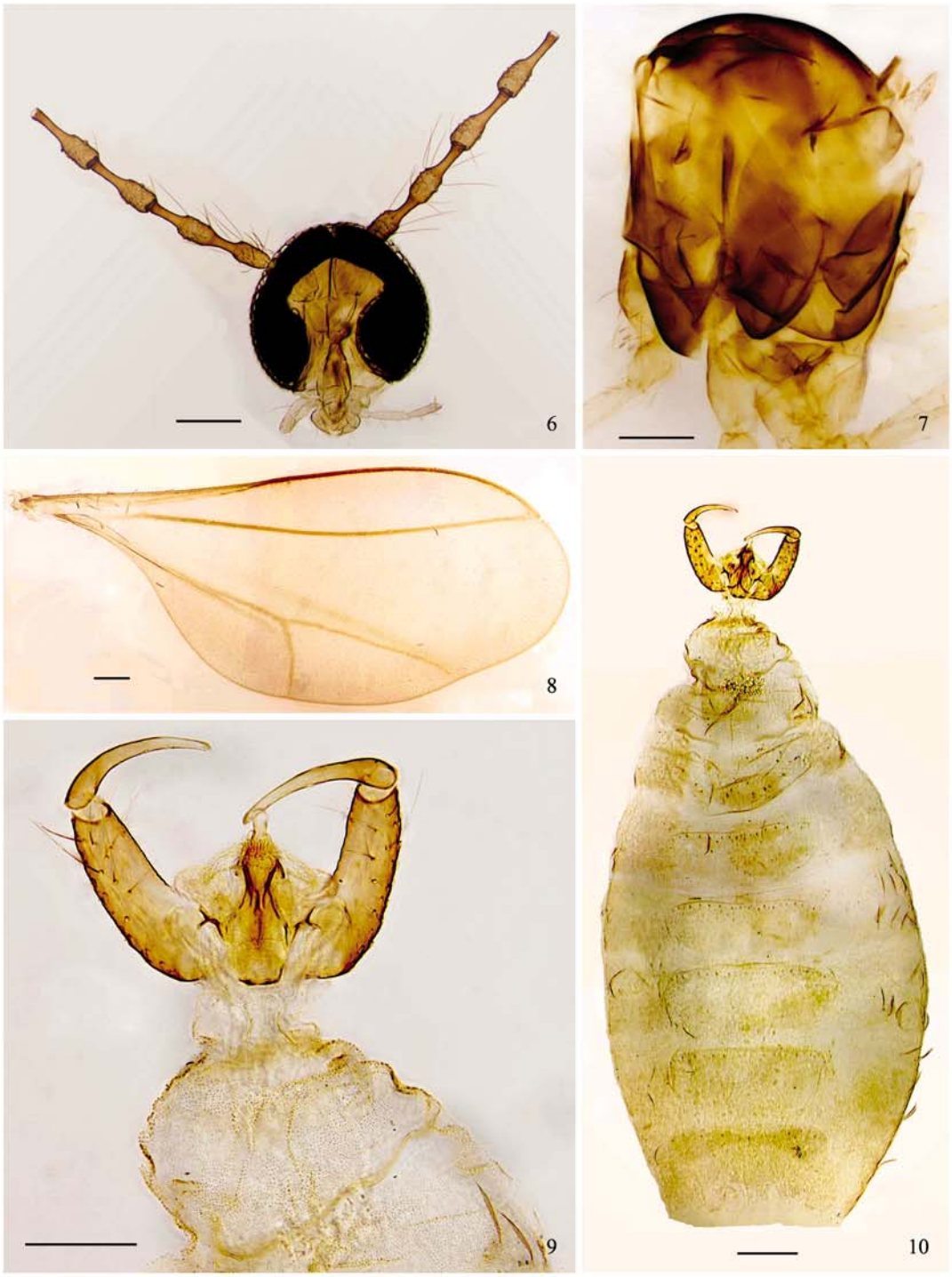


Figs 1 – 5. *Acinacistyla brevilobata* Jiao *et* Bu, sp. nov., male. 1. Fore acropod. 2. Middle acropod. 3. Hypoproct. 4 – 5. Genitalia. 4. Cerci and hypoproct removed. 1 – 2. Lateral view. 3 – 5. Dorsal view. Scale bars: 1 – 2 = 50 μm, 3 – 5 = 100 μm.

(Fig. 9) reduced to one strongly sclerotized, latitudinal and linear band; eighth tergite reduced to unsclerotized membrane; second through eighth sternites subrectangular covered with several scattered lateral and central setae, with one anterior pair of closely set trichoid sensilla; second through sixth sternites with an irregular but mostly single, posterior row of setae; seventh through eighth sternites with an irregular and double, posterior row of setae; seventh sternite shorter than sixth; eighth sternite shorter and much narrower than seventh.

Genitalia (Figs 3 – 5, 9). Gonocoxite (Fig. 3) having mediobasal lobe with one shorter, stouter, sub-spherical, densely pubescent sublobe away from aedeagus and the other longer, glabrous, winding sublobe clasping aedeagus, ventrally with two prominences at middle respectively protruding upward and laterad, and with one glabrous, sub-conical prominence outside of and 1/2 length of stouter and sub-spherical sublobe; gonostylus slender and slightly arched, gradually tapering from base to apex, approximately 2/3 length of gonocoxite, covered with a few setae and dense microtrichiae, with 1 short seta located apically on inner side, toothed apically; cerci separated deeply with a V-shaped incision forming two lobes, rounded apically with a few long lateral setae; hypoproct (Fig. 5) apically with chrysanthemum-shaped sclerotized structure, and subapically on both sides with a pair of conical, densely pubescent lobes approximately 1/3 as long as hypoproct; aedeagus gradually tapered to apex except for constriction at middle, a little shorter than gonocoxite, distally rounded with one pair of pores on both sides.

Female and immatures. Unknown.



Figs 6 – 10. *Acinacistyla brevilobata* Jiao *et* Bu, sp. nov., male (photomontaged by Auto-montage Essentials Software). 6. Head with 1st to 4th flagellomeres, anterior view. 7. Thorax, posterolateral view, wings and legs removed. 8. Wing. 9. Genitalia and abdominal segments 7 – 8. 10. Abdomen. 9 – 10. Dorsal view. Scale bars: 6 – 8, 10 = 100 μm, 9 = 50 μm.

Holotype male, China, Guizhou, Fanjing Mountain, Huguo Temple (27.5°N, 108.4°E), 28 – 29 May 2002, WANG Xin-Pu leg., alt. 1 350 m, Malaise trap, NKUCecid. No. BBH001. Paratypes: 1 male, China, Guizhou, Daozhen, Dasha River, Fairy Cave (also called as Xiannü Cave, 29.32°N, 107.40°E; alt. 600 m), 24 May 2004, ZHU Wei-Bing leg., Malaise trap, NKUCecid. No. BBH002; 1 male, China, Yunnan, Tengchong, Zhengding (25.01°N, 98.30°E; alt. 1 800 m), 3 – 5 Sep. 2002, XUE Huai-Jun leg., Malaise trap, NKUCecid. No. BBH003; 4 males, China, Yunnan, Lushui, Yaojiaping (25.59°N, 98.49°E; alt. 2 450 m), 16 – 18 Sep. 2002, XUE Huai-Jun leg., Malaise trap, NKUCecid. No. BBH004 – 007; 2 males, China, Jiangxi, Yifeng, Guan Mountain Nature Reserve, East

River Station (27.07°N, 104.09°E; alt. 1 000 m), 29 July to 1 Aug. 2002, XUE Huai-Jun leg., Malaise trap, NKUCecid. No. BBH008 – 009; 2 males, China, Jiangxi, Jinggang Mountain, Xiaoxi Cave (26.28°N, 114.14°E; alt. 220 m), 23 – 27 July 2002, XUE Huai-Jun leg., Malaise trap, NKUCecid. No. BBH010 – 011; 1 male, China, Henan, Luanchuan, Longyuwan, Jijiaojian (33.66° N, 111.75°E; alt. 1 600 m), 13 July 1996, LI Jun leg., NKUCecid. No. BBH012.

Distribution. China (Guizhou, Henan, Jiangxi and Yunnan Provinces).

Remarks. The new species from China is distinguishable from the type species, *A. papposa* by hypoproct subapically with a pair of conical lobes approximately 1/3 as long as hypoproct and the winding mediobasal sublobe ventrally with two prominences at middle, while the latter has hypoproct subapically with a pair of prolonged, geniculate lobes approximately as long as hypoproct, with a joint-shaped structure at basal 1/3 and the right cylindrical mediobasal sublobe without prominences.

Etymology. The specific name *brevilobata* means the male hypoproct subapically with a pair of relatively shorter lobes on both sides than ones of *A. papposa*.

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簇瘿蚊属分类学研究及一新种记述（双翅目，瘿蚊科）

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摘 要 对簇瘿蚊属 *Acinacistyla* Fedotova & Sidorenko 的属征进行修订，编写该属世界分种检索表（雄性），并记述采自贵州、云南、江西和河南四省的该属 1 新种，命名为短瓣簇瘿蚊 *Acinacistyla brevilobata* sp. Jiao *et* Bu, nov.，模式标本保存在南开大学昆虫标本馆。

短瓣簇瘿蚊，新种 *Acinacistyla brevilobata* Jiao *et* Bu, sp. nov.（图 1 ~ 10）

新种与分布于俄罗斯的柔毛簇瘿蚊 *Acinacistyla papposa* Fedotova & Sidorenko 在雄成虫外生殖节的抱器基节中基瓣及肛下板等特征相似，但区别明显：1）新种肛下板近端部两侧各着生 1 个约为肛下板长度 1/3 的端瓣，且该瓣不具关节状结构，而 *A. papposa* 肛下板近端部两侧各着生 1 个约与肛下板等长、在近基部 1/3 处具关节状结构的端瓣；2）新种抱器基节中基瓣的较长亚瓣卷曲并缠绕于阳茎；而 *A. papposa* 抱器基节中基瓣的较长亚瓣长棍状直立、且并不卷曲缠绕。

正模 ♂，贵州梵净山护国寺（27.5°N, 108.4°E; 海拔 1 350 m），2002-05-28 ~ 29，王新谱马氏网捕。副模：1 ♂，贵州道真县大沙河仙女洞（29.32°N, 107.40°E; 海拔 600 m），2004-05-24，朱卫兵马氏网捕；1 ♂，云南腾冲整顶（25.01°N, 98.30°E; 海拔 1 800 m），2002-09-03 ~ 05，薛怀君马氏网捕；4 ♂♂，云南泸水姚家坪（25.59°N, 98.49°E; 海拔2 450 m），2002-09-16 ~ 18，薛怀君马氏网捕；2 ♂♂，江西井冈山小溪洞（26.28°N, 114.14°E; 海拔 220 m），2002-07-23 ~ 27，薛怀君马氏网捕；2 ♂♂，江西宜丰官山保护区东河站（27.07°N, 114.09°E; 海拔 1 000 m），2002-07-29 ~ 08-01，薛怀君马氏网捕；1 ♂，河南栾川龙峪湾鸡角尖（33.66°N, 111.75°E; 海拔1 600 m），1996-07-13，李军网捕。模式标本保存在南开大学生命科学学院昆虫标本馆。

词源：种名 *brevilobata* 为一阴性复合拉丁形容词，意为“短瓣的”，指该种肛下板近端部两侧各着生 1 个相对于柔毛簇瘿蚊 *A. papposa* 较短的瓣。

关键词 双翅目，瘿蚊科，簇瘿蚊属，新种.

中图分类号 Q969.445.6

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